Data Limitations and Validation Report

for Environmental Groundwater Samples

Collected from the Argonne National Laboratory - West

Scoville, ID

Case No. 93111107

SDG. No. 93111107

Selected Target Analyte List (TAL) Metals plus Tin

One Aqueous Sample

Validated by:

3-6-96

Ricky C. DePaul
Data Validation
Reviewer

Approved by:

13-6-96

Joseph A. Samchuck
Data Validation Quality
Assurance Officer

A. TITLE:

INORGANIC DATA LIMITATIONS and VALIDATION REPORT

Project Site:	Water from Argonne National Laboratory - West
Sample Type:	Aqueous sample
Analysis Type:	Selected TAL Metals plus Tin
Case No.:	93111107
SDG. No.:	93111107

B. INTRODUCTION:

A complete review, following the procedures outlined in SMO-SOP-12.1.5[1], was performed on the data package, labeled Case No. 93111107, SDG# 93111107, submitted by Biospherics Incorporated. Based upon the information available for review, it appears as though, the laboratory analyzed the aforementioned water sample from the Argonne National Laboratory - West according to SW846 Method 6010 analytical protocols. The deliverable format does not comply with data package requirements pursuant with Level A validation protocol. All analytes with the exception of potassium were analyzed via Inductively Coupled Plasma (ICP) methodology.

C. CONTRACT AND TECHNICAL REVIEW:

Site:	Water from Argonne National Laboratory - West
Type:	Selected TAL Metals plus Tin
Case No.:	93111107
SDG No.:	93111107
Laboratory:	Biospherics Incorporated

Sample Identification:

FIELD ID	LAB ID
ANL-264-93	93111107-16

CTR COMMENTS:

1. Sample Chain-of-Custody (C.O.C.) Forms were not provided as applicable to the sample included with this Sample Delivery Group (SDG). Hence, the sample data could not be evaluated for holding time and preservation requirements. The sample appears to have been analyzed 4, 5, and 6 days after sample receipt at the laboratory. No further conclusions can be drawn based upon the information available for review.

2. Portions of the raw data were illegible and provided no useful information. It was not possible for the validator to verify reported sample results, as per Level A validation review criteria, versus the raw data. This is noted here for completeness.

3. Iron and thallium results were reported on the Form I while the same Form I indicates that these analytes were not part of the target analyte list. The data reviewer found no indication of these results upon review of the raw data.

4. The nondetected result for zinc in the environmental sample contradicts the positively reported value for this analyte as noted in the raw data. Note reference document of final test results in support documentation.

5. The sample data were not evaluated for blank contamination. Dilution factors were not chronicled on the Form XIVs as necessary for this evaluation. Furthermore, the laboratory routinely reported negative concentrations as noted on the quality control summary forms and on Form Is. Additionally,

the absence of reporting limits and the practice of reporting results below SOW reporting limits compromised the blank evaluation process. The data reviewer could not therefore evaluate blank contamination in accordance with SMO-SOP-12.1.5[1].

6. The laboratory did not adequately complete the ICP Interference Check Sample (ICS) Form IV. The interfering analytes aluminum, calcium, iron, and magnesium were not reported for this solution. No problems were noted with the reported ICSAB solution recoveries. However, recoveries were not reported for antimony and zinc as noted on the Form IV. These ICSAB found values for these analyses appear to yield acceptable recoveries. It is noted that interfering analytes were not present in the environmental sample at sufficiently low levels as to not introduce interference affects.

7. Graphite Furnace Atomic Absorption (GFAA) data and cyanide data were provided with this data package. This information has no application to the analyses of analytes as noted for the sample included in this SDG. For example, arsenic was not reported as an analyte of interest on the sample Form I. Furthermore, as this example illustrates, without adequate documentation via chain-of-custodies, the reviewer is not capable of determining the completeness of the project analytes of interest.

8. Review of the aqueous laboratory duplicate analysis revealed no problems with duplicate precision based upon validation review criteria. However, the format presentation of this quality control parameter was less than adequate. The laboratory did not calculate and report the Relative Percent Differences for these analyses. The validator notes this here for completeness.

9. The aqueous Laboratory Control Sample (LCS) recoveries, for numerous analytes, were not reported in some instances. Furthermore, the aqueous LCS found values for calcium, magnesium, and sodium were not reported. Thus, this quality control parameter provides no useful information regarding data usability.

10. The laboratory provided useless non pertinent information regarding GFAA Post Digestion Spike (PDS) recoveries as noted on the Form XIV. Additionally, the laboratory did not provide dilution factors and times of analysis relative to this sample. This information is critical to a thorough review of the data. These omissions introduce severe limitations to the data package as presented.

11. An Initial Calibration Verification (ICV) Percent Recovery (%R) for magnesium exceeded the 110% upper quality control limit.

12. The aqueous matrix spike recovery for silver was marginally below the lower quality control limit as noted on the Form 5A. Thallium and tin were not included in the matrix spike analysis.

13. Some results which were reported on the Form I do note have any associated quality control information. For example, aluminum was reported on the Form I but is not found on the Forms III and IV.

14. Meaningless values of "0.000" had been reported on the Form III in the instance for which it appears that no aqueous preparation blank had been analyzed.

15. Cyanide was not reported on the Form I as an analyte of interest but was included as part of the blank analyses as noted on the Form III.

16. Analysis times were not included as part of the raw data.

D. DATA LIMITATION OVERVIEW:

a. Summary of Qualified Data

Sample ANL-264-93 could not be fully evaluated given the limitations of the data package deliverable. Sample data qualifications were not made for the aforementioned quality control noncompliances (anomalies) as it is not possible to ascertain a cumulative affect of the type or severity of problems impacting sample data quality based upon the unacceptable format of the data package deliverable.

E. LABORATORY APPRAISAL:

The data package was presented in a format which could not be fully evaluated as per the validation review requirements as defined by Level A validation review criteria. Qualifications applied to the data serve to indicate problems which could effectively be identified based upon specific noncompliant quality control parameters. Various anomalies and inconsistencies prevented a logical and systematic evaluation process of identifying and qualifying analytical results with a given amount of certainty. The following notable items illustrate the systematic problems associated with this deliverable:

- inconsistent reporting of analytical results (i.e., results reported both above and below detection limits referenced in the SOW).
- absence of laboratory qualifications
- omissions of various analytes on various quality control summary forms.

Additionally, deficiencies noted with data presentation and reporting may not preclude additional, more severe problems with the data which could in affect render the data non usable. It is not possible to make an accurate and complete assessment of the data. Furthermore, overall data usability cannot be appraised for this data set as a result of problems noted with the deliverable.

F. REFERENCES:

1. Standard Operating Procedure For Inorganic Data Validation, "SMO-SOP-12.1.5", Environmental Restoration Program, EG&G, Inc., 1991.

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

ANL-264-93

Lab Name: BIOSPHERICS INCORPORATED Contract: ARGONNE

Lab Code: 9836 Case No.: 93111107 SAS No.: SDG No.:

Matrix (soil/water): WATER Lab Sample ID: 93111107-16

Level (low/med): LOW Date Received: 11/11/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	200	U		P	
7440-36-0	Antimony	60	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	50	U		P	
7440-41-7	Beryllium	5	U		P	
7440-43-9	Cadmium	5	U		P	
7440-70-2	Calcium	39600			P	
7440-47-3	Chromium	10	U		P	
7440-48-4	Cobalt	40	U		P	
7440-50-8	Copper	25	U		P	
7439-89-6	Iron	55			NR	NOT IN RAW DATA
7439-92-1	Lead				NR	
7439-95-4	Magnesium	12700	12800		P	
7439-96-5	Manganese	15	U		P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	40	U		P	
7440-09-7	Potassium	4040			A	
7782-49-2	Selenium				P	
7440-22-4	Silver	10	U		P	
7440-23-5	Sodium	17200			P	
7440-28-0	Thallium	5			NR	NOT IN RAW DATA
7440-62-2	Vanadium	40	U		P	
7440-66-6	Zinc	20	U		P	
	Cyanide				NR	
7440-31-5	Tin	50	U		P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA FROM FI LE MANILA FOLDER "93111107 METALS", ARGONNE SAMPLE NUMBER ANL 264-93 ALTHOUGH TWO ARE SPECIFIED IN BENCH SHEET